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MILITARY HIGH SPEED

MLC Rugged Metal LC Connectors

Super Tough Uni-Boot Duplex LC

DESCRIPTION

Amphenol's Uni-Boot Duplex Metal Bodied LC is precision manufactured from both machined and die cast alloy materials. It provides an LC compatible connector able to withstand abuse in tough military, industrial, and science applications.

Unlike commercial plastic connectors, the MLC can be terminated to standard commercial cables, also directly to Industrial, and Military-Tactical type cables. It features superior pull-strength between the connector and the cables, plus the metal latch arms provide a superior pull out strength to LC adaptor and transceiver ports.

FEATURES

- Fully compliant to IEC 61754-20
- Heat resistant to 135° C
- Improved resistance to shock and vibration
- Improved wear performance
- Compatible with Industrial & Military cables
- Superior latch retention & cable retention
- Available for MM, SM/PC, and SM/APC
- Low loss stable performance
- Compatible with OFP LC-Max for IP-68 protection
- RoHS compliant

APPLICATIONS

- Industrial
- Military
- Aerospace
- Marine
- Broadcast
- FTTx Deployments
- FTTA Deployments
- Test and Measurement

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Ordering Information

MLC connectors are supplied with Premium low loss singlemode grade ferrules for both SM & MM applications.

Part Number	Description
CF-198168-040	Metal LC Duplex Connector Kit - Inc. boot/ crimp set for 3.5mm Mini-Mil Tac cable & Commercial cables
CF-198168-041	Metal LC Duplex Connector Kit - Inc. boot/ crimp set for 4.8mm/5mm Mil-Tac cable

(Based on testing with master grade test lead)	Singlemode 9/125 UPC	Multimode OM4
Typical Insertion Loss	0.1 dB	0.08 dB
Max. Insertion Loss	0.2dB	0.15dB
Typical Return Loss	>55 dB	>25 dB
Ferrule	Premium SM	Premium SM

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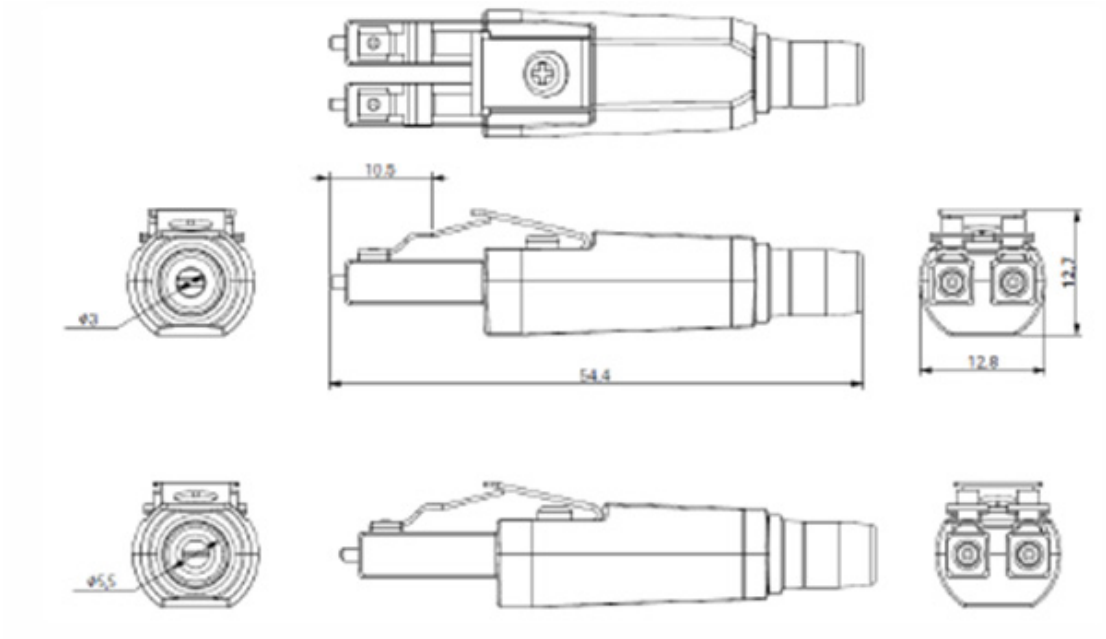
Components in MLC Connector

Label	Description
1	Boot
2	Inner Strain Relief Crimp
3	Outer Strain Relief Crimp
4	Upper Housing
5	Lower Housing
6	Duplex Latch Lever
7	M2 Screw
8	Metal LC Connector x 2

MLC Connector Dimensions



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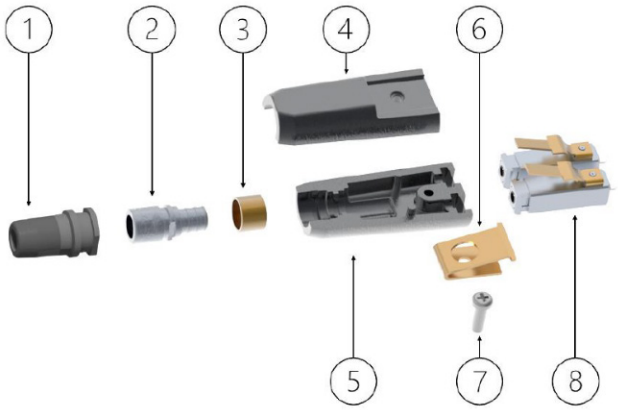
TOOLS REQUIRED

Item	Name
1	Cable jacket strippers
2	Fiber stripper
3	Ruler and fine marker
4	Crimp Tool SNW #12-PRSR
5	Syringe and plastic cone tip
6	S1125 resin
7	EPotek 353ND resin
8	Loctite222 threadlock
9	Multimode or Singlemode Iloss test set
10	Syringe & pink needle

DESCRIPTION OF PARTS

Metal LC Duplex Connector



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8	Metal LC Connector x 2
8	Dust Cap x 2 (not shown)

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CABLE PREPARATION

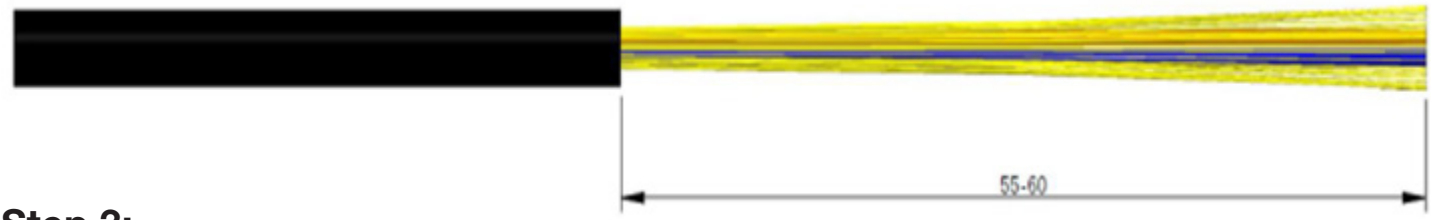
Step 1:

• Thread boot onto the cable, checking its' correct orientation. Boot options to suit cable size ~3.5mm & ~5mm are available.

Tip: If the fit is tight, use IPA as a lubricant if necessary.

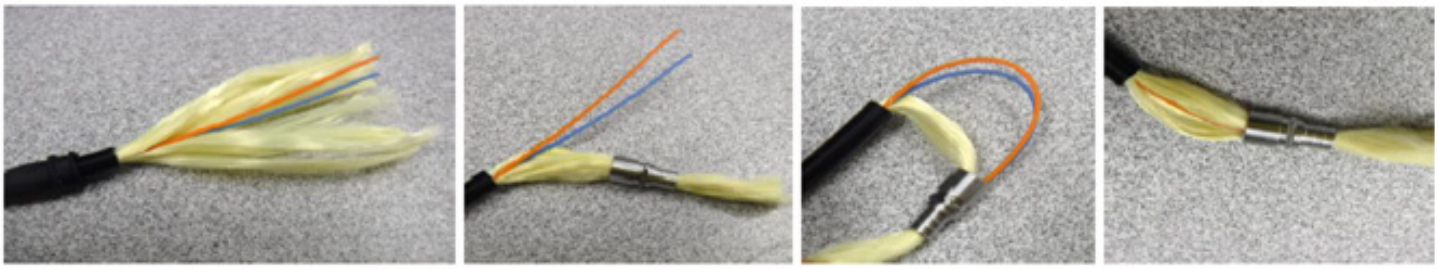
Step 2:

• Remove 55mm-60mm of the cable outer jacket. Separate the aramid yarns from the fibers. Ensure the buffer coatings of the fibers are not damaged during jacket stripping.



Step 3:

• Checking for correct component orientation, thread the inner crimp over the aramid yarns, twisting the yarns and pushing through the hole and pulling when the ends emerge. Loop the fibres around and pass them through the crimp without stressing them with a tight bend radius as shown below.



• Position the crimp close against the outer rugged jacket and add the outer crimp ring.

Do not crimp at this stage

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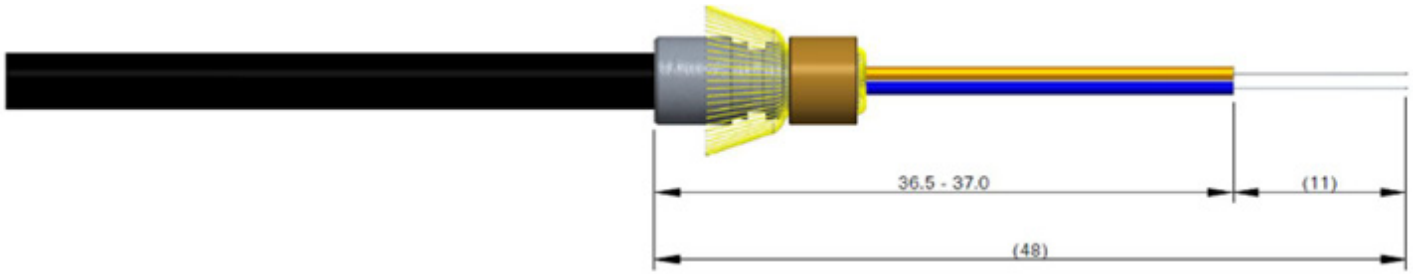
Step 4:

• Ensure the inner crimp is fully pushed back to and is engaged to the cable jacket. (Shown below). Slide the outer crimp ring into position capturing the aramid yarns, making sure they are evenly distributed radially. Temporarily tape the aramid yarns back to the jacket to tidy.

Step 5:

• Mark the secondary coating strip point at 36.5-37mm from the rear of inner crimp. Carefully strip the secondary coatings accurately to length, ensuring no damage to the fibers, and trim the bare fibers to 48mm.



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Step 6:

• Very carefully clean the fibres individually with a lint free tissue and IPA.

CONNECTOR TERMINATION

Step 7:

Prepare the Epoxy resin

Tip: Recommended Epoxy: Epotek 353ND

• Mix the Epoxy resin thoroughly in the sachet
• Fill a syringe capped with end bung with the epoxy
• Mix the epoxy and thoroughly outgas it for ten minutes using the centrifuge or other outgassing device
• Add needle to the syringe, vent any air bubbles and wipe clean

Step 8:

Metal LC Termination

• Push epoxy application needle up into the back of the flange and hold in firm contact with the back of the ceramic ferrule
• Press the plunger until epoxy resin emerges from the ferrule bore
• Release the connector and continue resin injection as the connector rises by ~2mm
• Remove the needle swiftly; do not inject beyond the 2mm rise
• Re-clean the bare optical fiber with lint free wipe soaked with IPA
• Carefully introduce fibre into the connector rear tube and through ferrule until the fibre emerges and the fibre secondary coating bottoms out at the rear of the ferrule

Note: Do not exceed the pot life of the epoxy recommended by the manufacturer

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Step 9:

Cure

• If using the recommended Epotek epoxy, using a suitable curing oven, cure for 30mins at 100-105 degrees C with temperature ramp up from room temp of a max 3deg/min.

Tip: For cure, orientate the LCs and cable such that individual connectors and cable do not require twisting or crossing when placed into the upper and lower housing. (Check channel arrangement for cable being terminated). Also ensure that during cure, the LC's do not move relative to the fiber tails, and the secondary coating position inside the individual LC's remains as originally inserted with the epoxy uncured.

Post Cure

• After the ferrules have cooled to room temperature, using a suitable cleave tool, remove the excess fiber protruding from the tip of the ferrule.

Note: Check the quality of the cleave tool being used. Be careful not to 'break the fiber off' with the cleave tool. Dispose of the cleaved fiber into a suitable 'sharps' bin.

Step 10:

Polishing & Inspection

• Polish and inspect connector geometry in accordance with Telcordia/IEC standards as applicable to the MM or SM end use.
• Visually inspect the polished end-faces, clean if necessary and place a dust temporary clean dust cap on inspected ends.

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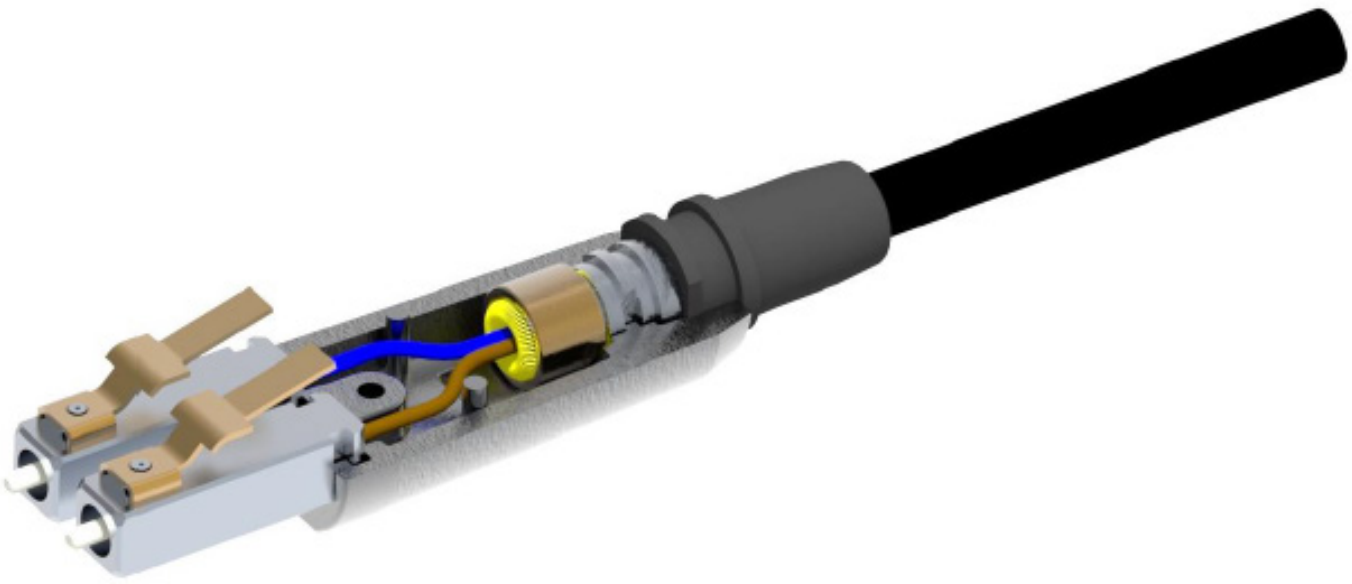
CONNECTOR ASSEMBLY

Step 11:

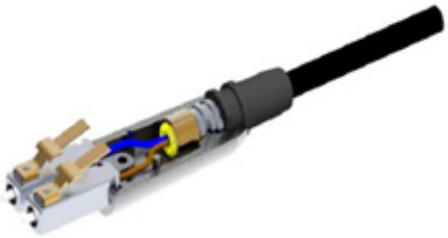
- Check fit of connectors crimp and boot in the lower housing.
- The flats of the crimp and boot need to match to sockets in the lower housing.
- The lay of fibres should not introduce additional insertion loss.
- Check insertion loss before final assembly as appropriate.



Step 12:

- Gently pull the outer crimp ring forward followed by the inner crimp body, keeping it just engaged with the jacket.
- Keep the aramid out of the way and add S1125 from a syringe to the cable jacket as shown in photo below (left).

• Push and rock the inner crimp back into position over the cable then remove excess S1125 with cotton bud or tissue.
• Trim the aramid yarn to length suiting the crimp type, re-engage outer crimp ring and crimp with the correct crimp/die tool.
• Then rotate the crimp tool 90 degrees relative to the original crimping and crimp for a second time.
• Mount the LC connectors and cable crimp arrangement into the lower housing, ensuring the flats on the boot and the crimp engage with the lugs on the housing (set vertically).
• Double check the secondary coated fibres lay in the bottom housing half without stress from excess bending due to fiber over-length, or tension if a fiber is too short.



Step 13:

• Add the upper housing, latch spring and screw together using thread-lock (Loctite 222 or similar) applied to the M2 screw thread.

Step 14: Final

• Perform final Insertion Loss and Return Loss testing to fully assembled product specifications.